AMA (ISSN: 00845841)

ISSN: 00845841
Volume 54, Issue 07, July, 2023

PANDEMIC LOCKDOWN: A CAUSE FOR MODIFYING THE FARMING STYLE

Ramesh Kumar[1], Rajesh Kumar[2*], Rupender Kumar[3], Dinesh Kumar[4]

SMS (Agrill. Extn.), KVK Ambala, Haryana- 133104[1]
DTP Operator, O/o Associate Director Publication, CCS HAU, Hisar, Haryana[2]
District Extension Specialist, (Agrill. Extn.), KVK, Rohtak, Haryana[3]
Assistant Professor, Deptt. of Plant Pathology, MAA College, Suratgarh, Raj[4]

Corresponding Author: 2*

Keywords:
Pandemic, Lockdown, Migrant labour, Adoption, DSR, PTR, and Constraints.

ABSTRACT

The goal of the study was to find out if farmers were more likely to use Direct Seeded Rice as a way to save resources than Puddled Transplanted Rice (PTR/transplanting method) when there was a shortage of workers during the COVID-19 lockdown. During the years 2020 and 2021, a study was done in the Haryana district of Kurukshetra on the pandemic and the problems farmers had with it. Randomly, 25 farmers from each of the four towns were chosen for the study. The 100 respondents were then interviewed using a specific interview schedule, empirical data was collected from each responder individually, and the data was then analysed using standard methods. According to the results, most of the respondents (77.50%) were in the Low to Medium category, and 22.50 percent of the farmers were in the High category for the total level of acceptance of DSR technology during the paddy season (Kharif 2020). While most farmers (87.50%) said they would adopt DSR technology at a low to medium level, only 12.50% said they would adopt it at a high level during Kharif 2021. That seems to mean that farmers adopted DSR at a slightly higher rate in 2020 than in 2021. This is because there was a shortage of workers during the Lockdown in 2020, which made them more likely to adopt DSR than PTR*. In fact, farmers need more people to help with transplanting/PTR, and foreign workers were easy to find before the lockdown. This happened so that the farmer would have to start using the DSR Drill/Machine during the Pandemic Lockdown. So the lack of machines during sowing was the biggest problem, since farms needed them more than ever because foreign workers were hard to find because of lockdowns and other problems. Farmers also had to deal with weed growth, not knowing enough about DSR farming, rain before germination, not wanting to change, etc., which were all very important problems that made it hard for them to use DSR technology. Findings also showed that personality traits, such as education, access to farm equipment, exposure to the media, economic motivation, innovativeness, training on DSR technology, contact with extension, and a willingness to take risks, had a positive and significant relationship with the level of adoption of DSR technology at the 0.05 probability level. So, the overall results show that farmers aren't using the recommended practises for DSR. This means that the government

needs to do more to raise farmers' awareness and keep up a strong promotion strategy that includes giving DSR farmers better incentives to increase the number of farmers who use DSR.

This work is licensed under a Creative Commons Attribution Non-Commercial 4.0 International License.

1. INTRODUCTION

When, in response to the COVID-19 epidemic, the Government of India ordered a total shutdown of the country on March 24, 2020, it helped the world understand and value migrant work force. After the shutdown began, it was very hard for foreign workers to move around, so many of them went home. A lack of workers hurt farms all over the world, which had a big effect on agriculture as a whole.2020 [17]. The idleness of foreign farm workers affects how hard it is to plant rice, which takes a lot of work.

More than half of the people in the world eat rice (Oryza sativa L.) every day. 90% of the world's rice is grown and grown on 90% of the world's rice land. In India, 120 million tonnes of rice are grown on more than 47 million hectares [2]. On the other hand, food consumption is expected to grow by 22% over the next 10 years, hitting 145 MT in 2033 [1]. But a new study says that this is because natural resources are being used up, the water table is getting lower, there are less workers and less energy, fuel prices are going up, and the weather is changing, all of which are causing factor output to go down and rice yields to stay the same. So, it's important to raise output while using less water, labour, land, and energy, among other things. Simply direct seeded rice (DSR), which is planted before or soon after pre-monsoon rain, is a good option in light of these problems because it can save water, reduce labour needs, reduce greenhouse gas (GHG) emissions, and adapt to climate threats [16], [19]. The replanting method for growing rice involves three important steps: puddling, moving, and keeping water in place. [21], [4] say that DSR could be used instead of these three methods. There are two types of direct sowing: dry-DSR and wet-DSR. In dry-DSR, dried food seeds are spread out or drilled into dry earth that hasn't been worked. (1) Wet-DSR, in which sprouting paddy seeds are sown or spread in lines on wet soil.

[18] says that after Punjab, Haryana is the state that gives the most money to the national rice pool. In 18 of the state's areas, most of the people work in rice growing. Seven of them are high-yielding, producing more than 2,500 kg/ha while using a lot of water to prepare the land and grow, which is bad for the water table. So, there is a big need to switch from traditional ways of growing paddy to DSR, which tends to use less water, less work, and makes it easier to keep the soil structure in good shape. Haryana's Department of Agriculture doesn't do anything to support the current ways of growing rice, called DSR, which are only used in a few rice-growing areas. In this situation, a poll study was done to find out how the DSR farming techniques that CCSHAU, PAU, and other SAUs/Agrill Research Institutes have been used and what problems farmers have had with them.

2. METHODOLOGY

During the COVID-19 outbreak of 2020–2021, this study was done in the state of Haryana. The area of Haryana called Kurukshetra was chosen at chance. Two blocks, Shahabad and Ismailabad in the Kurukshetra district, were chosen at random. Two villages were also picked at random from each of the two blocks. Raipur and Rai Majara from the Shahabad block, and Thol and Mandheri from the Ismailabad block in the district. Twenty-five farmers from each village were also picked at random. So, 100 farmers were picked at random through a process with several steps. The main data were gathered through interviews

with people using a well-thought-out questioning plan. The 26th version of the Statistical Package for the Social Sciences (SPSS) was used to organise and study observational data so that frequency, percentage, mean, correlation, and regression analysis could be calculated. For 17 claims, the farmers' answers were taken using a three-continuum scale for adoption level (fully adopted, partly adopted, and no adoption), and the scores were given as 3, 2, and 1 respectively. The nine most common problems that farmers see with using DSR technology were listed so that their answers could be collected on a three-continuum scale: Very serious, Serious, and Not so serious. Each of these problems was given a score of 3, 2, or 1 to show how serious it was. Based on these data, a weighted mean score (WMS) and a rank order were then made.

3. RESULTS AND DISCUSSION

Farmers in the DSR:Farmers' opinions about adopting DSR technology are likely to be affected by the interviewees' age, level of education, exposure to the media, economic motivation, inventiveness, touch with extension, risk orientation, etc. (Fig. 1.1–1. 12). As a result, these factors were taken into account in the research study, and it was found that more than half of the respondents (42.50%) were in the middle age group (43-57 years), while 41.20 percent of respondents were younger (up to 42 years), and 63.75 percent of farmers owned small to medium-sized farms (1-10 acres). When it came to schooling, more than 70% of the people who answered had finished upper-middle or middle-level high school. More than half of the people who answered (53.70%) had a middle level of exposure to mass media. This was followed by a high level (25.00%) and a low level (21.30%). Nearly half of the farmers (47.30%) had a middle level of connections with extension, while 33.9 and 18.8 percent of the farmers, respectively, had low and high levels of connections. 81% of farmers said that they had a medium or high amount of cash incentive. In terms of risk orientation, 42.3% had a middle risk orientation, 33.7% had a high risk orientation, and 24.0% had a low risk orientation. Almost 41% of those who answered said they had an average amount of creativity. [6] came to similar conclusions. They found that almost half of the DSR farmers were in the middle age group of 43–57 years, had finished their secondary schooling, and worked on 10–25 acres of land. Also, [7] came to the same conclusions about the traits of the study's respondents.

Personal Traits of respondents

I. Age of respondents

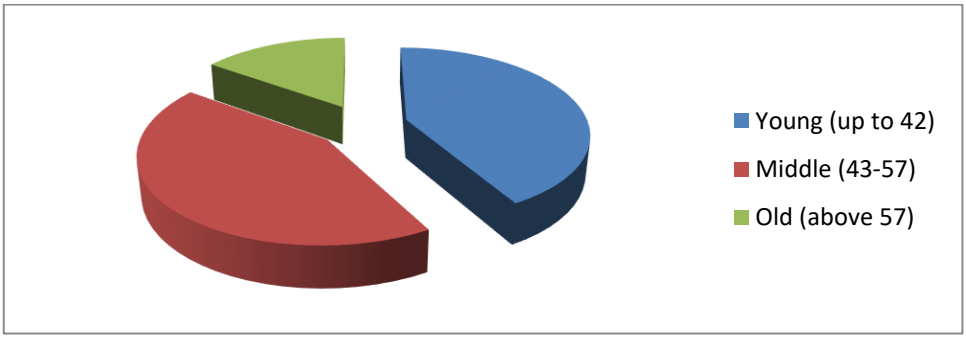


Fig. 1. 1. Age of Respondents

II. Education

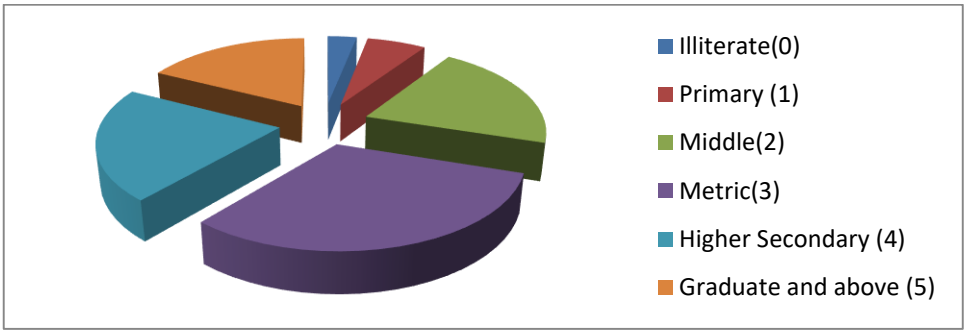


Fig. 1. 2. Education

III. Land holding (Operational)

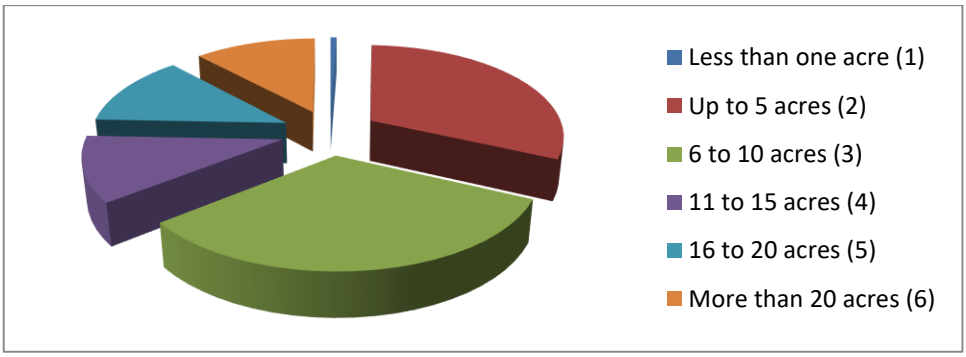


Fig. 1. 3. Land holding (Operational)

IV. Farm Power

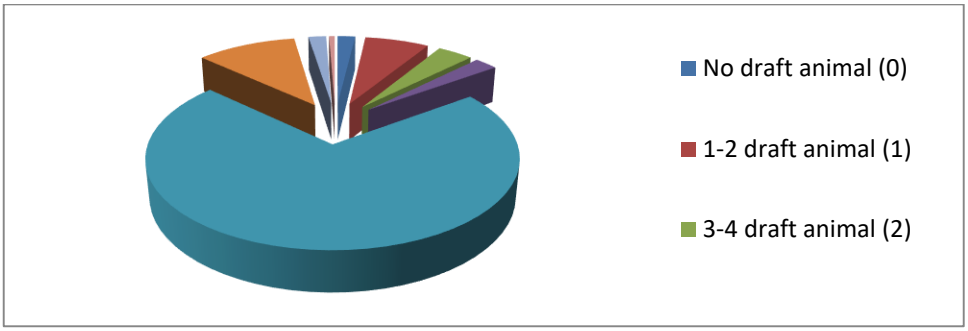
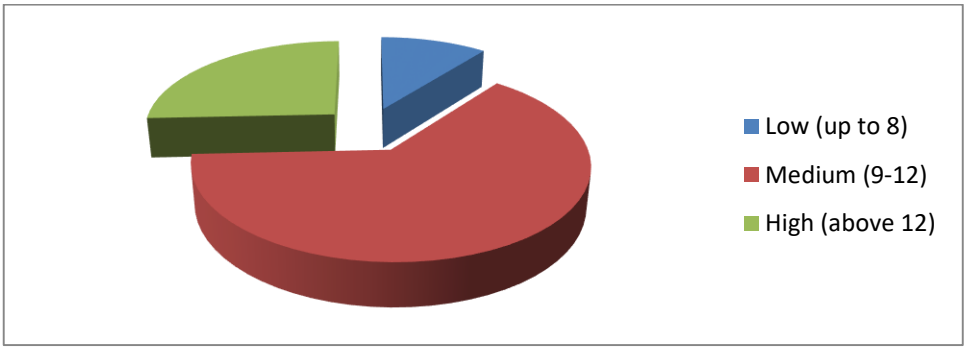


Fig. 1.4. Farm Power

V. Availability of Farm Equipment



ISSN: 00845841
Volume 54, Issue 07, July, 2023

Fig. 1.5. Availability of Farm Equipment

VI. Mass Media Exposure

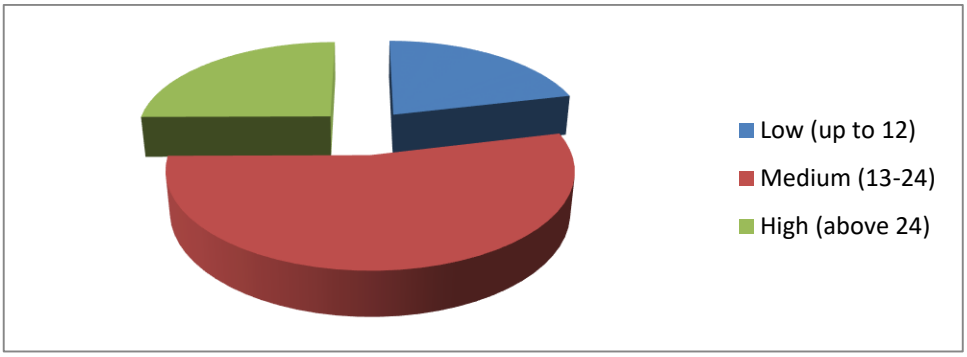


Fig. 1. 6. Mass media exposure

VII. Farming System

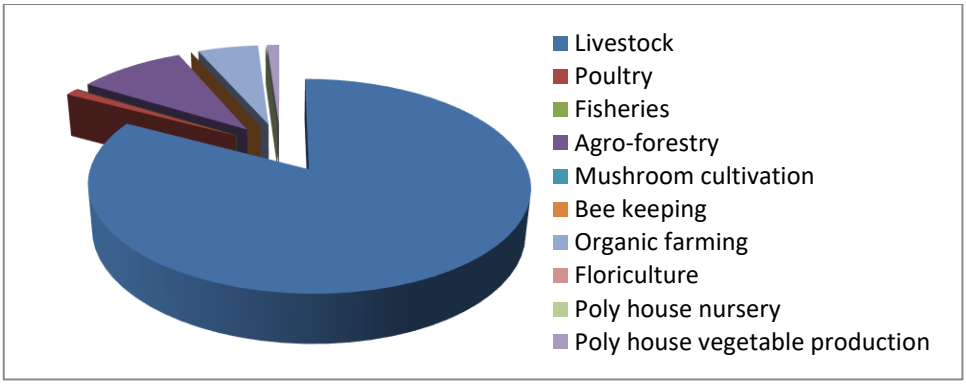


Fig. 1. 7. Farming system (multiple response/overlap)

VIII. Extension Contact

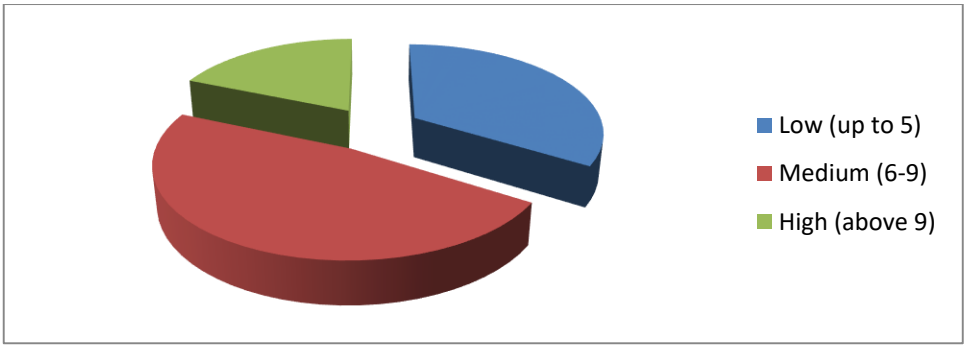


Fig. 1. 8. Extension contact

IX. Economic Motivation

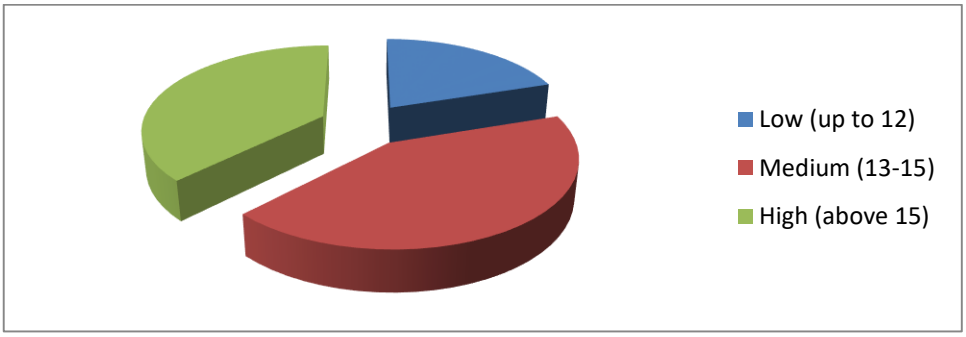


Fig. 1. 9: Economic motivation

X. Training received (selected RCT)

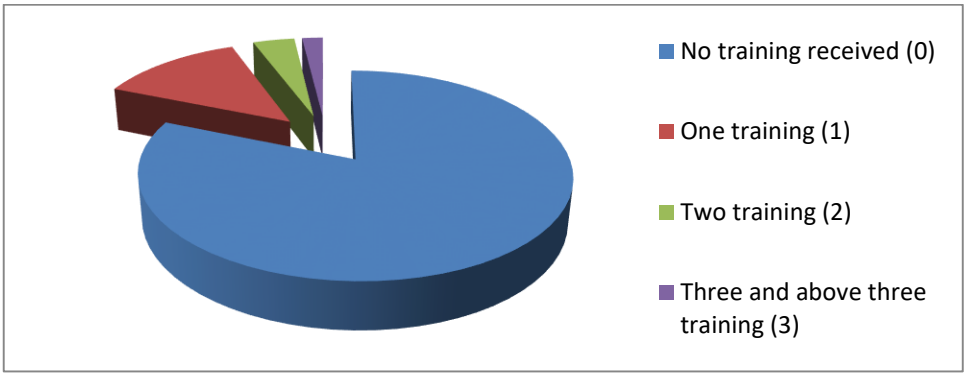


Fig. 1. 10. Training received (Selected RCTs)

XI. Risk orientation

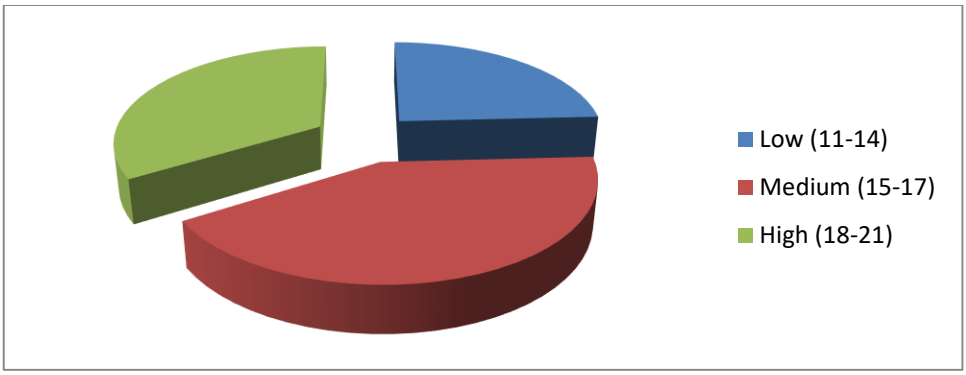


Fig. 1. 11. Risk orientation

XII. Innovativeness

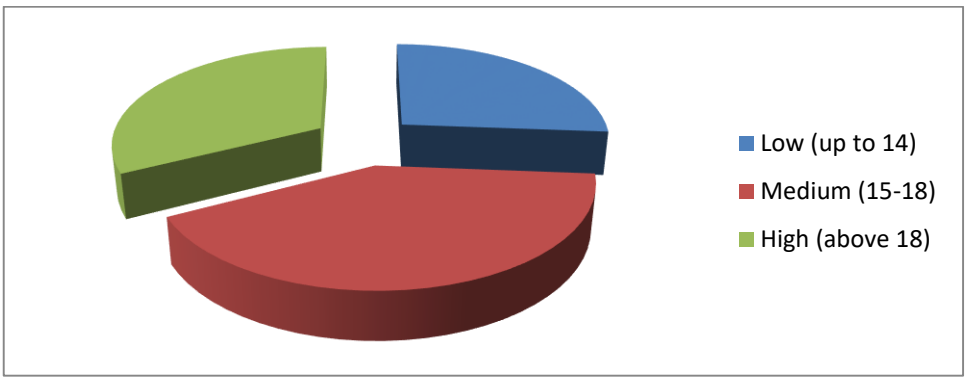


Fig. 1.12. Innovativeness

Farmers' adoption level of DSR cultivation technology

The data in Fig. 2.1 shows the ranking and weighted mean score of the practises that farmers used in 2020. These practises are: Method of spreading got the best weighted mean score (WMS) of 2.13, followed by Laser levelling and field preparation. made sure the dirt was good for planting rice directly, Change the depth of the seeds, The right time to prepare the pitch, Setting the machine to the right seed rate, DSR in a wet or tar-battered state, Used DSR machine with press wheel, DSR with a device for an angled plate Proper weed control, Treatment of seeds, Use of the right fertiliser, Irrigation based on the advice, Suitable variety, Spray recommended tool, Sowing time, and Stopped irrigation about a fortnight before maturity ranked II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, and XVII with WMS 2.11, 2.07, 2.01, 1.95, 1.93, 1.88, 1.82, 1.80, 1.76, 1.74, 1.72, 1.69, 1.65, 1.64, 1.51, and 1.48, respectively.

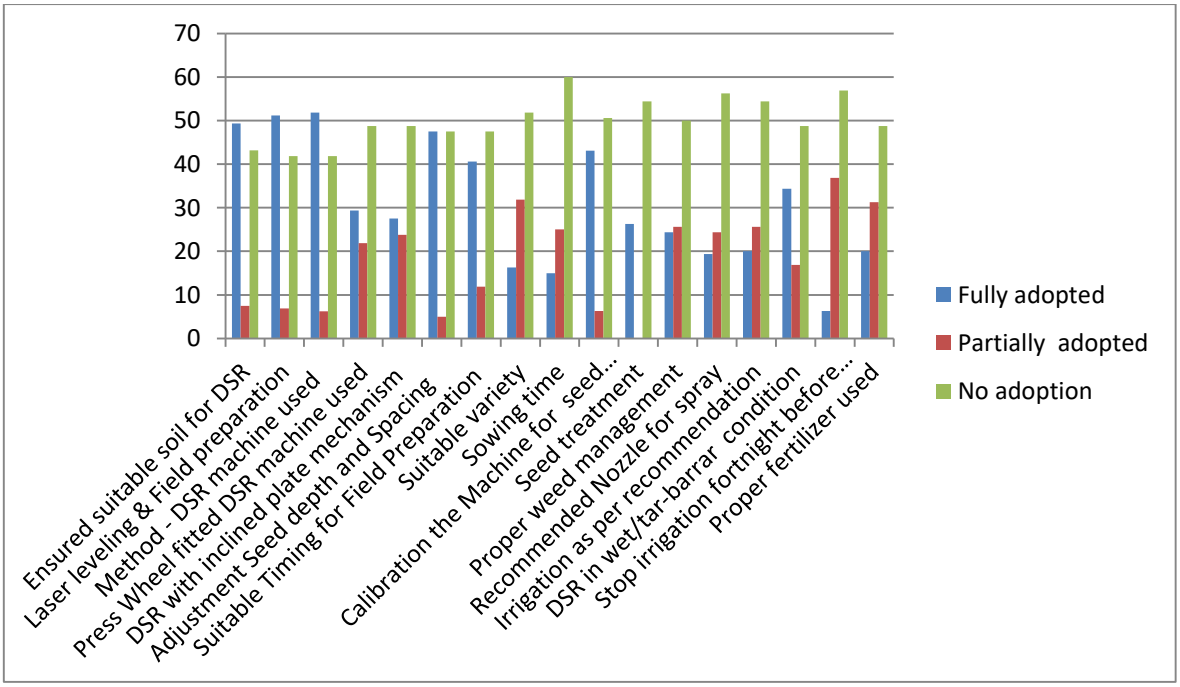


Fig. 2.1: Depicting the percentage of Recommended practices followed by the Farmers in 2020 under DSR cultivation

While the same practises were used by respondents in Kharif 2021, as shown in Fig. 2.2, the weighted mean score (WMS) was slightly lower than in 2020. This was because of the Covid-19 pandemic. The Method of sowing came in first, with a WMS of 2.09. Laser levelling and field preparation came in second, with a WMS of 2.07, and making sure the soil was good for direct-seeded rice came in third, with a WMS Both

tables showed that some of the practises are being done well enough for the CCS HAU, Hissar, PAU, Ludhiana to suggest that they be used everywhere. But most practises, such as treating the seeds, using the right amount of fertiliser, spraying with the recommended tool, sowing at the right time, etc., are only partly used. So, it is very important to encourage and help farmers by giving them incentives and setting up ongoing training, talks, campaigns, and demos. [8], saw similar results and said that there is still a lot to learn about the best ways to handle ploughing, levelling, seed sprouting, sowing, water and weeds when planting rice directly with a drum seeder in a puddle field.

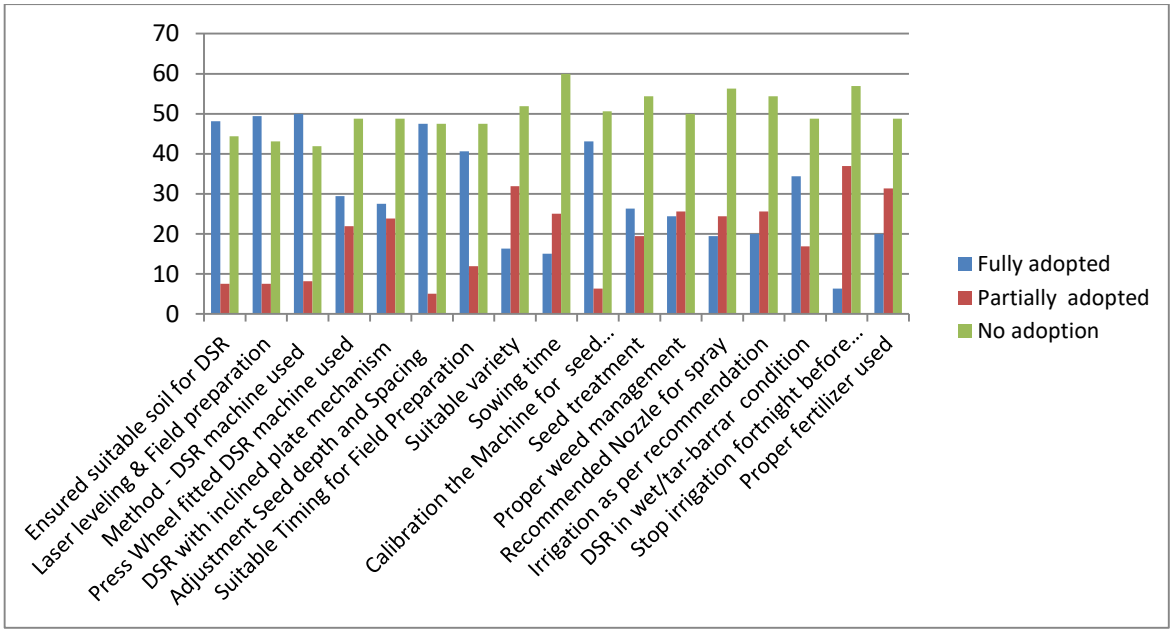


Fig. 2.2: Depicting the percentage of Recommended practices followed by the Farmers in 2021 under DSR cultivation

Overall adoption of DSR technology

Fig 3.1. reveals that less than half of the farmers (46.87%) fell into low level adoption followed by medium (30.62%) and high level of adoption category (22.50%) Further study of the data suggests that most of the respondents (77.50%) held a low to medium level of overall adoption of DSR technology of farmers for the year of 2020.

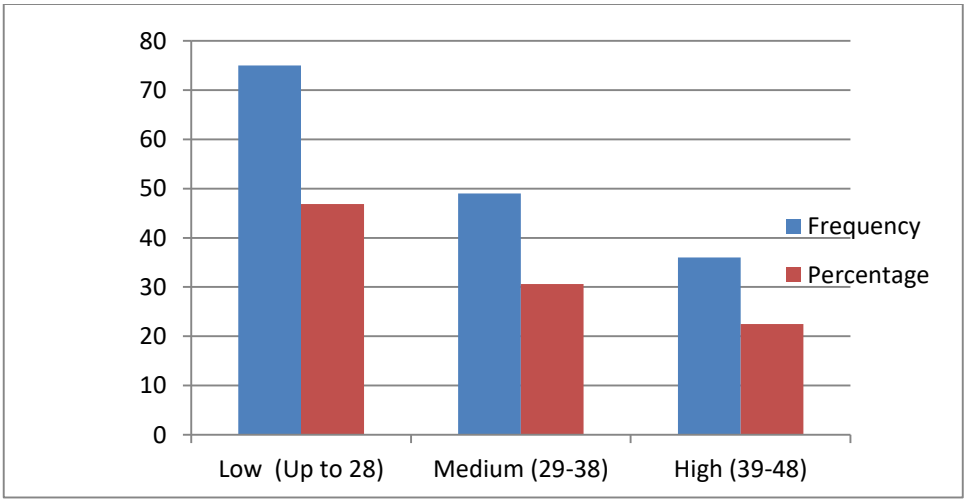


Fig. 3.1. Over all Adoption of practices followed in 2020 by farmers in DSR technology

ISSN: 00845841
Volume 54, Issue 07, July, 2023

In the case of the year 2021, however, Fig. 3.2 shows that more than half of the responders (63.75%) were in the low level of adoption group, followed by the middle level (23.75%) and the high level (12.50%). A closer look at the data shows that most of the people who answered the survey (87.50%) thought that DSR technology would be adopted at a low to medium level. It is clear that there were more farmers in the high group in 2020 than in 2021. It looks like farmers did not follow all of the steps that SAUs had suggested. It could be because farmers don't know about DSR technology, don't know how to promote it well, don't have the right rewards, or have strong ties to the old way of growing rice. So, the government should give farmers incentives and let them know about DSR technology through reliable mass media like farm magazines and literature, as well as DSR-related radio and TV programmes, which are important for adding to the farmers' knowledge and reaching as many farmers as possible so that the technology is quickly adopted by the farming community [9].

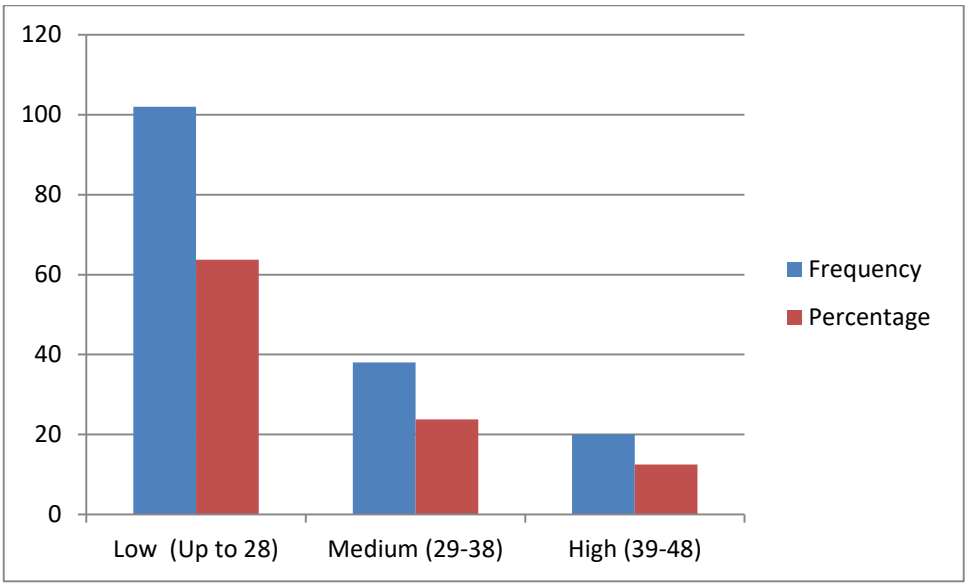


Fig. 3.2. Over all Adoption of practices followed in 2021 by farmers in DSR technology

Constraints faced in adoption of DSR cultivation technology

Fig. 4.1 shows the respondents' problems with using DSR technology in 2020. The biggest problem was not having a DSR machine at the time of sowing, which got the highest weighted mean score of 2.65. Other problems included weeds, rain before germination, too much or too little water at sowing, the depth of the seed, filling gaps, not knowing enough about DSR cultivation, not having enough iron, and not wanting to change.

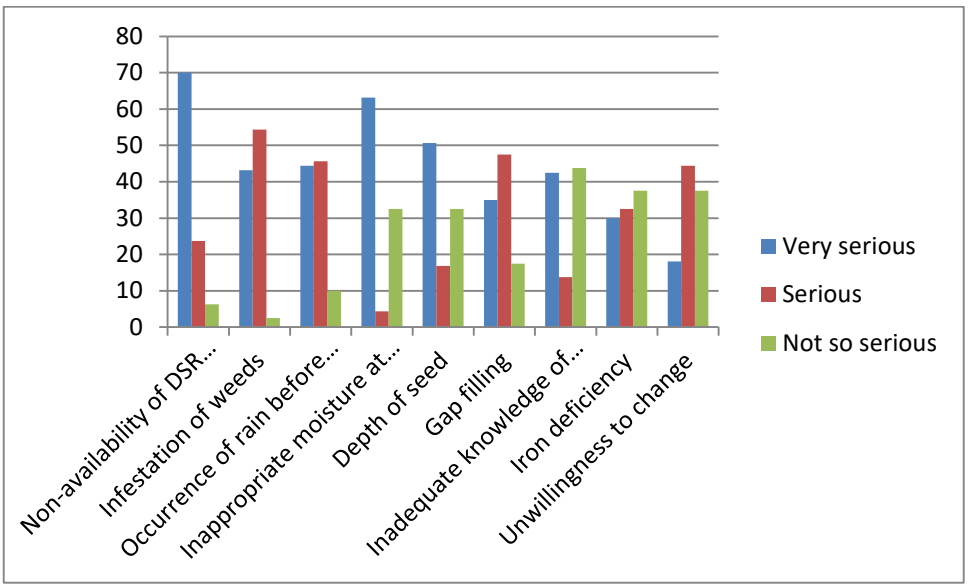


Fig. 4.1. Depicting the degree of seriousness in rank wise order and in percentage of constraints perceived by the Respondents in 2020

When it comes to the problems farmers will face in 2021, Fig. 4.2 shows that weed infestation came in first with the highest weighted mean score (WMS) of 2.86, followed by lack of knowledge of DSR cultivation, rain before germination, unwillingness to change, no DSR machine at the time of sowing, iron deficiency, gap filling, too much or too little moisture at sowing, and depth of seed.

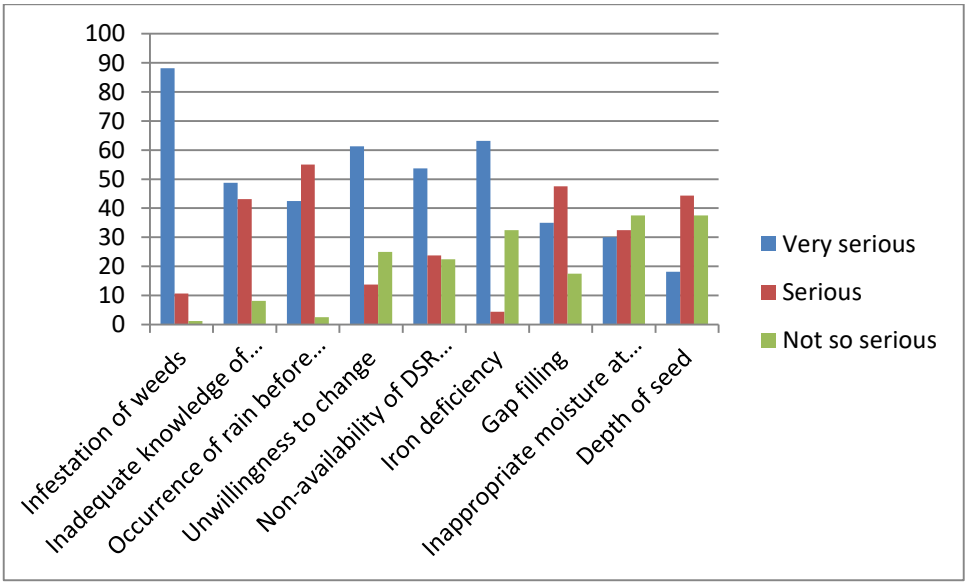


Fig. 4.2. Depicting the degree of seriousness in rank wise order and in percentage of constraints perceived by the Respondents in 2021

Due to the COVID-19 pandemic, there was very little or no migrant labour available during the lockdown. This forced farmers to use DSR drills instead of the traditional PTR method, which required a lot of labour. As a result, demand for DSR machines went up right away, and farmers had trouble getting them (as shown in Figures 4.1 and 4.3). Government should give DSR machine on more subsidy and easily to individual farmer as well as cooperatives/CHC and enough incentives, organise appropriate awareness programmes and technical hands-on trainings for efficient operation of DSR, and show farmers how to use it in the field.

In the same way, [10] found that most farmers had a problem with not knowing enough about DSR cultivation, which was a very important issue. So, in order to use DSR technology [11] the government should set up a full skill development training programme about all the steps and procedures and package of practises of DSR.

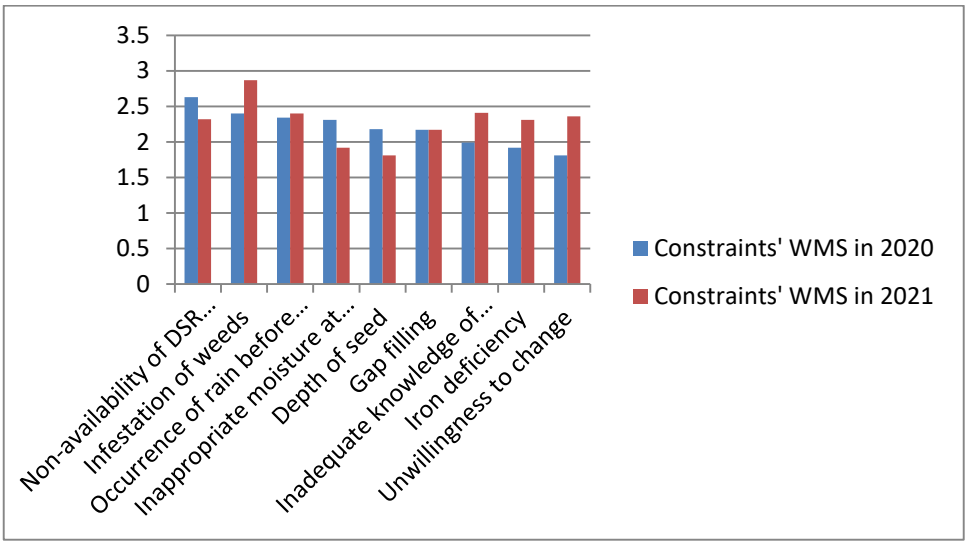


Fig. 4.3. Depicting Weighted Mean score of Constraints perceived by Farmers during 2020 & 2021 in adopting the DSR Technology

Relationship between farmer's personality traits with their adoption level of DSR cultivation technology

The Graphical Chart (Fig. 5) shows that the "correlation coefficient" between farmer's personality traits, such as education, land holding, availability of farm equipment, mass media exposure, economic motivation, innovativeness, training received on DSR technology, extension contact, and risk orientation, showed a positive and significant correlation at the 0.05 level of probability with their adoption level of DSR technology, while age, farm power, and farmi When it came to the "regression coefficient," things like schooling, access to farm tools, exposure to the media, economic motivation, creativity, and contact with extension were found to be important. But age, land ownership, farm power, farming method, training got, and risk attitude did not have a big effect on how much DSR technology was used. [12] found the same thing. The studies by [13], [3] also back up some of these findings. Also, it was said that all of the chosen independent variables in the study led to a 62% difference in the amount of adoption of DSR technology when all other variables were kept the same. This means that only 62.0% (r2 = 0.62) of the difference in adoption was caused by these factors, and the other 38.0% was caused by variables that were not part of the study.

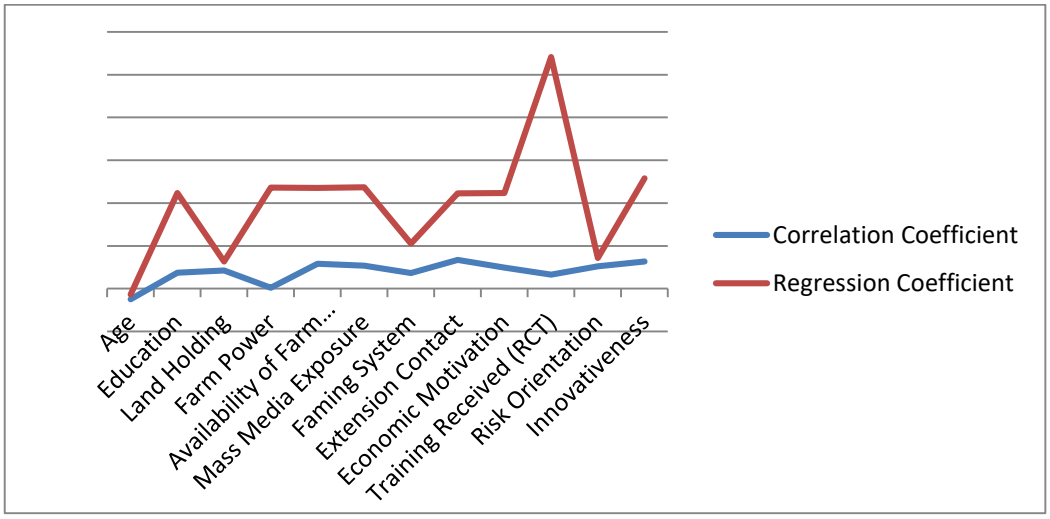


Fig. 5. Relationship between farmers' adoption level of direct seeded rice (DSR) with their personality traits

4. CONCLUSION

Because of the COVID-19 pandemic, there wasn't much or any migrant labour available during the lockdown. This led farmers to switch to a method that saves natural resources, saves time and money, and saves labour. This method is called "Direct Seeded Rice." In the end, it can be said that research has shown that the lack of migrant workers caused by the Covid-19 pandemic had a positive effect on the DSR adoption rate because it pushed farmers to replace the old PTR (Puddled Transplanted Rice) technology with the new DSR technology. Because they couldn't find foreign workers in shutdown, they had no choice but to follow DSR practises. Also, because of this situation, farmers wanted more DSR drills than were available during the lockdown. According to the study's results, the demand for DSR machines went up right away. Because of this, farmers had trouble getting DSR drills in 2020, which was the worst case scenario. The government should make it easier for individual farmers and cooperatives/Custom Hiring Centres to get DSR machines and give them enough incentives. They should also set up appropriate awareness programmes and technical hands-on operation of DSR drills, trainings for managing DSR crops and timely method and field demonstrations for farmers.

5. REFERENCES

[1] Anonymous (2020). Annual report 2019-20. Ministry of Planning. Government of India, Delhi.

[2] Anonymous (2021) Economic Survey of India (2020-21). Ministry of Finance, Government of India, Delhi.

[3] Ehsanullah, N. Akbar, K. Jabran and T. Habib. (2007). Comparison of different planting methods foroptimization of plant population of rice (Oryza sativa L.) in Punjab (Pakistan). Pakistan Journal of Agricultural Sciences, 44, 597-599.

[4] Kamboj, R., Singh, D. and Kaur, L. (2022). Adoption Status of Direct Seeded Rice Technology by the Farmers of Punjab. Indian Journal of Extension Education, 58 (1), 76-80.

[5] Kaur, M., Mahal, A. K. and Sekhon, M.K. (2011). Adoption of labour saving technology in paddy transplantation-micro level evidences from Punjab. Agricultural Economics Review, 24, 568-580.

[6] Kumar R (2022). A Study on Agricultural Resource Conservation Technologies in Haryana. Ph. D.

Thesis. Chaudhary Charan Singh Haryana Agricultural University, Hisar.

[7] Kumar R, GodaraAK,SainiN,BishnoiD K, Malik, A.K.and Kumar N (2022). Adoption Extent of Farmers about Zero Tillage Seed Drill Technology in Haryana. The Pharma innovation J 11(3): 294-296.

[8] Kumar, R., Singh, V.D., Kumar, A., Prem, G., Singh, R.K., Kumar, Y. (2022). Farmers' Extent of Knowledge toward Happy Seeder Technology. Agricultural Mechanization in Asia Africa and Latin America. Volume 53, Issue 11, November, 10421- 10427.

[9] Kumar, R., Singh, V.D., Kumar, A., Singh, R.K., Kumar, Y., Kumar, D., Malik, A.K., Kumar, R. (2022). Direct Seeded Rice cultivation technology- Acceptance Status in Haryana state of India. Agricultural Mechanization in Asia, Africa and Latin America. Volume 53, Issue 11, November, 10273-10280,

[10] Kumar, R., Singh, V.D., Singh, R.K., Kumar, D. (2022). Preference Direct Seeding Over Transplanting Technology in Rice during Lockdown Period in Haryana. Agricultural Mechanization in Asia, Africa and Latin America. Volume 53, Issue 10, 10199- 10208.

[11] Kumar R, GodaraAK,KumarN,BishnoiD K, Arun P D, and Kumari N (2022). Knowledge Level of Farmers about Direct Seeded Rice Cultivation Technology in Haryana. The Pharma innovation J 11(2): 432-434.

[12] Kumar R, GodaraAK, Prem G, KumarN,BishnoiD K, MalikAKand SainiN (2022). Awareness Level of Farmers Towards Direct Seeded Rice Technology in Haryana State of India. Agricultural Mechanization in Asia, Africa and Latin America, 53(3): 6523-6528.

[13] Kumar, R. Batra, S. C. and Kumar, M. (2018). Use pattern of direct seeded rice (DSR) technology in paddy. International Journal of Pure & Appield Bio-Sciences, 6 (6), 562-578.

[14] Mahajan, G., Sharma, R., Kaur, R., Chauhan, B.S. (2015). Comparison of photoperiod-sensitive and photoperiod-insensitive basmati cultivars for grain yield, water productivity and quality traits under varied transplanting dates in Northwest India. Crop Pasture Science, 66(1), 793–801.

[15] Monikha, C. R., Balasubramaniam, M., & Sukumar, J. (2021). Effectiveness of extension tools among the Paddy Farmers of Tenkasi district of Tamil Nadu. Indian Journal of Extension Education, 57(1), 110-113.

[16] Rakesh, S., Mahajan, G., Mukesh, S., Angrej, S., Chauhan, B.S. (2017). Performance of drip-irrigated dry-seeded rice (Oryza sativa L.) in South Asia. Paddy Water Environment, 15, 93–100.

[17] Ramkumar, R.(2020) Agriculture and the Covid-19 Pandemic: An Analysis with special reference to India. Review of Agrarian Studies 10 (2369-2020-1856)

[18] Rohila, A.K., Ghanghas, B.S., Kumar, A. and Sehrawat, P.S. (2018). Constraints Perceived by Farmers in Adoption of Direct Seeded Rice Cultivation in Haryana. Indian Journal of Extension Education, 54 (2), 168-175.

[19] Sebastian, J., Janvier, A., Frederick, A., Siddiqui, A., & Singh, V. (2017). Propagation of direct seeded

rice-a case of Muktsar city. Contemporary Research India, 7(1), 97.

[20] Singh, R., Hansra, B.S. and Chand, R. (2013). Knowledge and Adoption level of Farmers of Haryana about Scientific Rice Cultivation Practices. Journal of Community Mobilization and Sustainable Development, 8(1), 24-28.

[21] Visalakshi, M. and Sireesha, A. (2016). Adoption status of direct seeding rice using drum seeder. Journal of Rice Research, 9(1), 30-34.